

## REMARKS

The paper is responsive to a Final Office Action mailed on July 12, 2005. Prior to this response, claims 8-10 and 12-25 were pending. After amending claims 8, 14, and 21, canceling claims 12, 18, and 24, and adding claims 26-27, claims 8-10, 13-17, 19-23, and 25-27 remain pending.

In Section 1 of the Office Action claims 8-10, 12-14, 16-21, and 23-24 have been rejected under 35 U.S.C. 102(e) as anticipated by Werkhoven et al. ("Werkhoven"; US 6,703,708). The Office Action states that Werkhoven describes a first metal nitride layer 432 of "Wn, TiN, TaN etc.", and a second metal nitrate layer 434 of (WN)Cu, citing col. 16, line 36 – col. 20, line 21.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

To further clarify the claimed invention, claims 8, 14, and 21 have been amended to include the claim limitations of claims 12, 18, and 24, respectively (now canceled). This limitation states that the first and second barrier layers must be one of the following materials: TiN, TaN, W, Wn, or Si<sub>3</sub>N<sub>4</sub>. As noted in the Office Action, Werkhoven only mentions one material that may be used as the metal nitride layer 434; this material is a tungsten copper nitride [(WN<sub>x</sub>)<sub>y</sub>Cu<sub>z</sub>]. Since this (WN)Cu material is *not* mentioned as one of the eligible second metal nitride materials in claims 8, 14, and 21 (as amended), Werkhoven does not describe all the limitations of the claimed invention. Because Werkhoven

does not explicitly describe every limitation of the claimed invention he cannot anticipate claims 8, 14, and 21. Claims 9-10 and 13, dependent from claim 8, claims 16-17 and 19-20, dependent from claim 14, and claim 23, dependent from claim 21 enjoy the same distinctions from the cited prior art.

In Section 2 of the Office Action claim 15 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Werkhoven. The Office Action states that the claimed time limitations could have been discovered by one of routine skill in the art. This rejection is traversed as follows.

An invention is unpatentable if the differences between it and the prior art would have been obvious at the time of the invention. As stated in MPEP § 2143, there are three requirements to establish a *prima facie* case of obviousness.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck* 947 F.2d 488, 20 USPQ2d, 1438 (Fed. Cir. 1991).

Werkhoven describes his second metal nitride layer 434 as a transition region. This is because he is transitioning from a first metal nitride layer 432, to a Cu seed region 436 (col. 16, ln. 45-56). At col. 17, ln. 3 through ln. 10, Werkhoven generally describes that the transition region should start with a 0% Cu content at the interface to the first

nitride layer 432, and end with about a 50% Cu concentration at the interface to the seed layer 436. Explicit details of the deposition processes are described from col. 17 to col. 20.

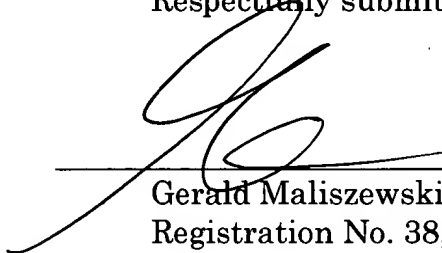
With respect to the third *prima facie* requirement, as mentioned above in response to the anticipation rejection, Werkhoven does not explicitly describe one of the eligible second metal nitride materials. Neither is there a suggestion that materials, other than (WN)Cu, can be used for Werkhoven's transition layer. Therefore, Werkhoven neither suggests nor explicitly describes all the limitations of claim 14. Claim 15, dependent from claim 14, enjoys the same distinctions from the cited prior art and the applicant requests that the rejection be removed.

Section 3 of the Office Action states that claims 22 and 25 would be found allowable if rewritten in independent form. In response, a new claim (claim 26) has been added that includes the subject matter of claims 21 and 22. Claim 27 is a new claim that includes the subject matter of claims 21 and 25.

It is believed that the application is in condition for allowance and reconsideration is earnestly solicited.

Respectfully submitted,

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